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W. D. O'CONNOR.

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Rec'd of Capt D. P. Robbins.
Buffalo Oct 24. 1892

BUFFALO HISTORICAL SOCIETY.



THE

UNITED STATES
LIFE-SAVING SERVICE.

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THE
UNITED STATES LIFE-SAVING SERVICE.

This institution was formally established during the past year, by an act of Congress approved June 18, 1878. It is the only exclusively governmental establishment of the kind in the world, the life-saving institutions abroad being all voluntary societies supported by the donations of benevolent persons; and to this country belongs the eminent distinction of having organized an elaborate system of relief for seafarers wrecked upon its coasts, backed by the means and energies of the Government.

Although the coast of the United States is more extended than that of any other maritime country, and is fraught with peculiar difficulties and perils to navigators, as many shipwrecks show, the public movements for protecting the lives imperiled by disaster upon

it appear to have long been remarkably feeble and disconnected, considering the active sympathy called into play by constantly recurring calamity. The first regular attempt at organized succor was made by the Massachusetts Humane Society, an association of gentlemen originally formed in 1786, incorporated for general purposes of benevolence in 1791, but directed toward the alleviation of the miseries of shipwreck in 1789, when it placed some huts on desolate portions of the coast of Massachusetts for the shelter of mariners who might escape from the sea, the first building for this purpose being erected on Lovell's Island, near Boston. In 1807 this society established the first life-boat station at Cohasset. Subsequently it erected a number of others. Its efforts, although necessarily limited by reliance upon volunteer



LIFE-SAVING CREW WITH HAND-CART LOADED WITH APPARATUS.

crews and by the conditions of extemporized service, were of such value as to evoke at various times some pecuniary aid from both the State and the General Government. An appropriation of \$5,000 made by Congress in 1847,

"for furnishing the lighthouses on the Atlantic coast with the means of rendering assistance to shipwrecked mariners," which for two years lay unused in the Treasury, was permitted to be expended by this society in 1848. In 1855

It received from Congress an appropriation of \$10,000; in 1857, another of \$10,000; and again in 1870, one of \$10,000. The extension in 1872 of the Government life-saving service to Cape Cod relieved the society of its onerous charge in this region, and enabled it to devote its main energies to the better protection of other parts of the Massachusetts coast. The society still continues its wardenship of such localities, and has now 78 stations. No other organized efforts, outside of those of the Government subsequently described, were made to mitigate the distresses of shipwreck, beyond those of three or four other societies, all ephemeral in their character, except the Life-saving Benevolent Association of New York, chartered by the Legislature of that State in 1849, which is still in existence, but whose operations have been mainly exerted in other and limited channels of benevolence.

For nearly half a century the efforts of the Government for the protection of navigators upon our coasts were listless and occasional. In 1807 an attempt was made to organize a national Coast Survey, which failed. The charts and sailing directions used for the guidance of mariners were for a long period of foreign origin, and extremely untrustworthy. These were superseded, however, by charts and a "Coast Pilot" of great value, made by the Messrs. Blunt from surveys of leading harbors and the more frequented and perilous parts of the Atlantic coast, undertaken at their own expense. In 1820 there were but 65 lighthouses, all poorly built, mostly badly located, and furnished with oil lamps of inferior illuminating power. In 1832 the important step was taken of establishing the Coast Survey, which at once began its magnificently comprehensive labors and the publication of complete and accurate charts. About the same time the Engineer Corps of the army began a similar survey of the Great Lakes. The gathering movement in aid of commerce extended to the lighthouse system, which by 1837 had 208 fixed and floating lights in operation. At the latter date Congress passed an act authorizing suitable public vessels to cruise upon the coast to assist shipping in distress, and the revenue cutters were designated for this duty; an action which resulted in as much benefit as could have been expected from the limited number of vessels comprising the fleet. No other measures in aid of the mariner were taken till 1848, a date which marks the inception of the Life-saving Service. In August of that year a vigorous and graphic appeal was made in the House of Representatives by the Hon. William A. Newell, of New Jersey, which secured an appropriation of \$10,000 for providing surf-boats and other appliances for rescuing life and property from shipwreck on the coast of that State. With this money eight buildings were erected at different points, and furnished accordingly. An important feature of these appointments was the life-car, the invention of which is in dispute

between Mr. Joseph Francis, of New Jersey, then a boat-builder of the Novelty Iron Works of New York, and Captain Douglas Ottinger, an officer of the Revenue Marine, under whose supervision the establishment of these stations was effected. In March, 1848, Congress made a further appropriation of \$20,000 for life-saving purposes. With half this sum eight buildings were erected and furnished on the coast of Long Island, under the supervision of Mr. Edward Watts, a civil engineer, aided by a committee of the before-mentioned New York Life-saving Benevolent Association. The remainder of the money was devoted to establishing six additional stations on the coast of New Jersey, under the superintendence of Lieutenant (now Captain) John McGowan, of the Revenue Marine, assisted by a committee of the Philadelphia Board of Underwriters. The same year, as before stated, an unexpended appropriation of \$5,000, made two years before, was allowed to be expended by the Massachusetts Humane Society upon Cape Cod, so that life-saving protection was extended simultaneously to the coasts of Massachusetts, New York, and New Jersey, thus inuring to the benefit of the commerce of Boston, New York, and Philadelphia. The newly established stations, though manned upon occasion only by extemporized crews, so proved their value at several scenes of shipwreck that the next year, 1850, Congress again appropriated \$20,000 for life-saving purposes. Half this sum went to the establishment of additional stations on the coast of Long Island, and one at Watch Hill, Rhode Island, under the supervision of Lieutenant Joseph Noyes, of the Revenue Marine, cooperated with by the New York Life-saving Benevolent Association. The remaining \$10,000 was used in placing life-boats at different points on the coasts of North and South Carolina, Georgia, Florida, and Texas, and sheltering them with boat-houses. The growing interest in the protection of navigation was strikingly shown two years later by the act of Congress organizing the Lighthouse Board. The system of lighting the coast had continued to be imperfect, although the number of lights had been increased to 320—a paltry number, however, for the then second commercial nation in the world; and all but seven of them were oil lamps with common reflectors. But in 1852, the date of the legal organization of the Board, this service underwent a memorable transformation. A scientific programme for regularly lighting the coast was adopted; towers of masonry or iron, built by the highest engineering skill, arose at selected points, crowned with the splendid Fresnel lenses, whose drum of prisms augments the light eightfold; responsible keepers were appointed, under inspection and discipline, as wardens of these beacons; and the work of development was begun which has resulted in the establishment of 1,336 lights on the seacoasts and the shores of the great Western rivers, together with a large number of day-

marks, fog-signals, and buoys. The Coast Survey was also continuing its vast hydrographic labor, extended to a study of the Gulf Stream and its influences, and the laws and operations of tides, currents, winds, and storms, and changes of the shore, and involving the copious issue of the best possible charts and other publications of signal value to seafarers and maritime interests generally. It is possible that the achievements of these two noble branches of the public service, acting on the mind of the nation, had a reciprocal effect upon the fortunes of the nascent Life-saving Service; for in the years 1853 and 1854 Congress appropriated \$42,500 for its uses. With this money fourteen new stations were added to those on the New Jersey coast, built under the care of Mr. S. C. Dunham, and eleven on the coast of Long Island, under the supervision of Mr. J. N. Schillenger. Twenty-three life-boats were also placed at points upon Lake Michigan, and several others at various places on the Atlantic and Lake coasts. Exclusive of the boats at the 55 stations on the New York and New Jersey coasts, there were in 1854 eighty-two life-boats at different localities elsewhere.

This was the date of the organization of the present life-saving system. Order now began to stream from chaos. During the winter of 1870-'71 several fatal disasters, some of them occurring near the stations, others at points where stations should have been, and all referable to irresponsible employees, inadequate boats and apparatus, or remoteness of life-saving appliances, roused the Treasury Department, then under the administration of the Hon. George S. Boutwell, to make proper representations upon the subject to Congress, which on April 20, 1871, appropriated \$200,000, and authorized the Secretary of the Treasury to employ crews of surfmen at each stations and for such periods as he might deem necessary. In the February previous Mr. Sumner I. Kimball took charge of the Revenue Marine Service, and the life-saving stations, being then under the charge of that bureau, also became the subject of his consideration. The first step was to definitely ascertain their condition. At his instance, Captain John Faunce, of the Revenue Marine, was detailed for this duty, and set out on a tour of inspection of the stations, Mr. Kimball accompanying him a portion of the way. Captain Faunce's report was submitted on August 9, 1871. The report disclosed stations too remote from each other and from the scenes of periodic shipwreck; the houses filthy, misused, dilapidated, some in ruins, the remainder needing enlargement and repairs; outfit defective or lacking, even such articles as powder, rockets, shot-lines, hawsers, and shovels being often wanting; apparatus rusty or broken through neglect, sometimes destroyed by vermin, or by those evil persons who, as Bacon says, are but a higher kind of vermin; larceny everywhere active, every portable article being stolen from some of the stations; the keepers often living

at a distance from their posts, a number of them too old for service, most of them appointed rather for their politics than their competency; the crews at the alternate stations chosen for the same reason, fitness for duty being always a secondary consideration, and these crews, under the system of arbitrary alternacy, often failing to stations where they were least needed, making discontent rampant among the volunteers called into service by disaster at the stations intervening, and breeding quarrel and disaffection among the coast populations. Such was the condition of affairs at that time. The vigorous prosecution of reform was at once begun. In obedience to a resolution then adopted and ever since adhered to, though against manifold obstacles, that professional fitness should be the indispensable and the only requisite for the agents of the Life-saving Service, the removal of all incapable and inefficient keepers, and the appointment of the best obtainable experts in their places, were commenced. At the same time nearly all the stations were manned with crews of carefully selected surfmen, chosen without regard to their politics, and for such periods as the limited appropriations would admit; and the patrol of the beaches each night, and during thick weather by day, was inaugurated. This important feature, by which those imperiled upon stranded vessels are promptly discovered by the beach sentinels, and speedily made the objects of life-saving effort, distinguishes the United States service from all others in the world, and largely accounts for its unparalleled triumphs in rescuing shipwrecked seafarers. Simultaneously with these measures, definite instructions in regard to their duties were issued to the keepers and crews. The next step was to bring the stations within distances of from three to five miles of each other, in order that neighboring station crews might be massed together by signal or message, should extra help at a wreck be required. To this end, twelve new houses were built on the New Jersey coast and six on the Long Island, and the location of some existing stations changed. The old stations were also rebuilt or enlarged for the accommodations of their occupants and of rescued persons. Means being limited, all the stations of this period were made the plainest possible houses, 42 feet long and 18 feet wide, of four rooms and two stories. One room below contained the boats, wagon, surf-car, mortar, etc.; the other was furnished as the mess-room of the crew. In the upper story, one apartment was fitted with cot-beds and bedding, and the second was adapted for storing the lighter apparatus. These measures and arrangements, somewhat provisional in their character, and struck off to meet the present exigencies, carried the young service on the two coasts through the winter of 1871-'72. The result of the new organization was striking. The record of the season on the two coasts shows that every person imperiled by

shipwreck was saved. Fatal disasters, hitherto incessant, appeared to have suddenly ceased, as a plank when sawed through drops to the ground.

The success of this season excited lively interest in the service. A station had been authorized by Congress in March, 1871, for the Rhode Island coast; and in June, 1872, one more for that coast and nine for Cape Cod, Massachusetts, were authorized, thus extending the system to the beaches of two other States. These stations were built and put in operation by the winter of 1872. Encouraged by the record of the past season, operations were vigorously continued for the one to come. The selection of the best available apparatus first engrossed attention. A commission to decide upon this point was procured, consisting of officers of the Treasury and Navy and experienced beachmen, which met in May, 1872, at Seabright, New Jersey, to examine and test various life-saving appliances, and reported in favor of a modification of the New Jersey cedar surf-boat, an *éprouvette* mortar, the India-rubber life-saving dress invented by Mr. C. S. Merriman, and the Coaton night-signals, all of which were brought into use at the stations with satisfactory results. Before the arrival of the season for opening the stations, a comprehensive code of regulations for the government of the service was prepared. These regulations arranged the coasts of Massachusetts, Rhode Island, New York, and New Jersey into three districts, assigning each district to the charge of a local superintendent, chosen from civil life, and placing the whole under the inspection of an officer of the Revenue Marine (Captain J. H. Merriman). Upon these officers they laid the duty of periodical examinations of the stations, and the drill and exercise of the keepers and crews in life-saving manoeuvres with the boats and apparatus. They also provided for the keeping of journals or log-books by each keeper, recording the state of the weather and the surf, and all occurrences at the several stations; transcripts from which were required to be forwarded each week to the office at Washington. Each keeper was furthermore required to transmit to headquarters a carefully prepared report of each disaster occurring within his precinct. The regulations minutely defined the duties of keepers and surfmen in regard to service at wrecks and the performance of patrol, and made provision for their instruction in resuscitating persons apparently drowned. The preservation and repair of the buildings, the regular outfit and supply of the stations, the periodical returns upon proper books and forms of the condition of the station appointments, the methods of keeping the district accounts, and the general fiscal management of the service, came within the scope of their provisions. They provided for boards of examiners to determine the professional qualifications of the keepers and crews, and to bar all but experts

from the service; and they established a code of signals, with flags for day service and rockets for night, to enable the patrolemen to communicate with the stations, and the stations to effect intercourse with each other. Under these regulations the efficiency of the service was greatly promoted, and the season of 1872-'73 was triumphantly passed, only one life being lost by shipwreck within the domain of the establishment.

This continued success induced Congress in March, 1873, to extend the system to other coasts, and mainly by the efforts of the Hon. John Lynch, of Maine, then a Representative in Congress, and a leading member of the Committee on Commerce, to the charge of which matters relating to this service were committed, a bill was passed appropriating \$100,000 for new life-saving stations, and calling for a report of points for others upon the sea and lake coasts, with detailed estimates of cost. This magnanimous legislation resulted in the creation of two new districts, one embracing the coasts of Maine and New Hampshire, the other the coasts of Virginia and North Carolina between Cape Henry and Hatteras, and placed five new stations on the Maine coast, one on the New Hampshire, five on the Massachusetts, one on the Rhode Island, three on the Virginia, and seven on the North Carolina. The stations were not, however, put into operation until the year following, owing to delay in selecting sites and procuring titles. To make the report called for by the law, a commission was formed in March, 1873, immediately after the passage of the bill, consisting of Mr. Kimball and Captains John Faunce and J. H. Merriman, of the Revenue Marine. Their report, made in view of the actual and prospective extension of the service on a national scale, was the prominent feature of the work of the year, and involved a comprehensive mental survey of the nature and characteristics of our vast and varied coasts on the ocean and the lakes, personal inspection and study of the principal localities, and numerous consultations with underwriters, ship-owners, captains of vessels, veteran seafarers, and all varieties of sources of relevant information. It was transmitted by the Secretary of the Treasury to Congress, with his approval, in January, 1874. Guided by its recommendations, Congress passed the act of June 20, 1874, authorizing the classification of stations into three groups, designated respectively as complete life-saving stations, life-boat stations, and houses of refuge; establishing a number of stations of the several classes upon the Southern, Pacific, and Lake coasts; creating five new districts, each with its local superintendent at a salary of \$1,000 per annum; providing for the bestowal of medals of honor, in two classes, upon persons endangering their lives to save others; and empowering the collection and tabulation by the Life-saving Service of statistics of disaster to shipping, both in Government and maritime interests, and also with a

view of determining, by reference to the periodicity of marine casualties, the points necessary for the protection afforded by life-saving stations, and other means for preventing and mitigating marine disasters—a matter of the gravest importance on this and other accounts, which had up to this time been strangely and unaccountably neglected by the Government. The operations of the service for the year 1873-'74 had meanwhile been actively continued. The storm-signal system of the Signal Service had been connected with seven stations on the New Jersey coast, an appropriation of \$30,000 having been made by Congress for the general connection of the system with the life-saving stations and lighthouses. The record of the season at its close showed 1,165 lives saved on the three coasts; only two were lost.

During the year 1874-'75 twenty-two new stations established under the act of March, 1873, were put into operation. The number of lives saved this season was 855, and there were 16 persons lost. Fourteen of these were from the Italian bark *Giovanni*, wrecked on Cape Cod on March 4, 1875, too far from shore to be reached by the shot-line from any ordnance then invented, and in a surf in which no boat could live. This loss was the first serious disaster which the service had suffered since its organization, though fortunately it was one not chargeable to any fault of the establishment. By direction of the central office, efforts were at once commenced by Captain Merriman, assisted by officers of the Ordnance Corps, to increase the range of the wreck artillery.

In the following year, 1875-'76, the work of creating the stations authorized by the law of June 20, 1874, was actively pushed. Six stations on the Maryland and Virginia coast were completed and put into operation, involving the organization of an additional district designated No. 5. A gun, designed by R. P. Parrott, Esq., of the West Point Foundry, Cold Spring, N. Y., with a maximum range of 631 yards, but too heavy for transportation in ordinary life-saving use, was placed at Peaked Hill Bar, Cape Cod, the scene of the wreck of the *Giovanni*. A life-raft was added to the apparatus at several stations. A new self-righting and self-bailing life-boat, devised by Captain J. M. Richardson, the Superintendent of the First Life-saving District, of much less weight and draught than the English, was stationed for trial at Whitehead Island, Md. The storm-signal system was still further extended to several of the Atlantic stations. This year several incompetent keepers and surfmen were discovered in the Sixth District stations by the Examining Board, put there by local politicians, and were promptly ejected, and the District Superintendent was dismissed. The number of persons saved from wrecks was 729. The persons lost were 22—7 of them washed overboard before stranding, 6 drowned by attempting to land in the ships' boats, and 9 by in-

safely jumping *en masse* into the surf-boat as it came alongside in the darkness, capsizing it instantly, and also drowning the life-saving crew. This disaster occurred on the coast of North Carolina, from the Italian bark *Nuova Ottavia*.

In the year 1876-'77 four new districts were organized—three embracing the lake-coast, and one on the coast of Florida. Thirty-five new stations of the number authorized by the act of June 20, 1874, were put into operation, including five houses of refuge on the Florida coast. A new gun for service at wrecks, considerably lighter than the gun formerly in use, and with a maximum range of 473 yards, was invented by R. P. Farrott, Esq., and brought into use at a number of the stations. The second serious attempt to subordinate the interests of the service to local politics was this year discovered by the Examining Board in the newly organized Fifth District, a number of political retainers, without character as surfmen, being found at the opening of the season installed in the stations as keepers and surfmen. They were promptly thrown out, and their places filled by professionals. The local superintendent, in consideration of his having been terrorized by the politicians into accepting these men, and in view of his own high personal and professional character, was kept in the service, with a stringent admonition against another lapse of this kind. The stations this year continued in effective running order. The number of lives saved was 1,500. One tragic disaster occurred in the loss of the British ship *Circassian*, from which 28 persons perished, the vessel being beyond the reach of the wreck ordnance, and the terrific sea rendering boat service impossible. The ship's company had all been rescued by the life-saving crew about three weeks before, at the time of its stranding, and those lost were mainly a corps of wreckers who had been employed to get the vessel off, and whose leader had refused to allow the life-saving crew to keep a line between the vessel and the shore. Besides these, 11 lives were lost on other coasts, seven of them by the swift disintegration, in an ordinary sea, of a rotten vessel upon striking, before the crew could either take to their own boat or receive help from the shore; three at the stranding of the French steamer *L'Amérique* by an attempt of the sailors to land; and one by a man being washed overboard before striking.

The next year, 1877-'78, is memorable in the history of the service for active efforts and important results. The life-saving establishment at its close embraced 148 stations. Of these, 18 were life-boat stations, 16 of them on the Lakes and 2 on the Pacific coast, together with 5 houses of refuge on the coast of Florida. The two Pacific stations were built during the year. In the latter part of 1878 two new life-saving stations were built on the coast of Long Island, one at Coney Island, the other at Short Beach. Two of the old stations were rebuilt, and 26 others repaired. On the New Jersey coast, two stations were also rebuilt and 36 repaired. Four of the Richardson self-righting and self-bailing life-boats were constructed, and placed respectively at Orleans, Mass., Fire Island, N. Y., Absecon Inlet, N. J., and Townsend's Inlet, N. J. A code of signals for communication between vessels in danger or distress and the life-saving stations was devised by the Signal Service, and signals for similar night communication were brought into contemplation. A line of telegraph built by the War Department for the Signal Service, between Cape Henry and Cape Hatteras, running in the neighborhood of several of the life-saving stations on the North Carolina coast, and communicating with headquarters at Washington, proved of great benefit to the establishment by affording instant intelligence of wreck operations. Preparations were made by the Chief Signal Officer, at the instance of Mr. Kimball, for establishing telephones at twelve of the stations on the same coast, for the purpose of accomplishing intercommunication with the keepers, which have since been put into effective operation. The extension of the service, and the many improvements which had been introduced, called for a thorough revision of the regulations, which was accordingly made by direction of the Hon. John Sherman, Secretary of the Treasury. The most remarkable achievement of the year was that of Lieutenant D. A. Lyle, of the Ordnance Corps, who was detailed, at the request of the Life-saving Service, to conduct experiments in increasing the range of wreck artillery, and who succeeded in devising two bronze guns, one weighing with its projectile only 202 pounds, which has carried a line 695 yards, and a smaller gun weighing with its projectile only 102 pounds, which has an extreme line-carrying range of 477 yards. This result would appear to make catastrophes like those of the *Giovanni* and *Circassian* impossible. The year was one of severe tempests, there being 171 disasters to vessels within the scope of life-saving operations—the highest annual number previously known to the service being 134. In the report of the service for 1876, the General Superintendent, commenting upon the remarkable success which the establishment had achieved in saving life, and claiming it as the legitimate fruit of organization, had remarked that, if ever the annual result should be less proud, it would be because the Government failed to meet the demands made by the natural development of the service. There had recently been such a failure, and this year the predicted result followed. An appropriation by Congress below the estimates submitted, prevented the stations on the North Carolina coast from being opened for service earlier than the 1st of December, and six days before this time arrived 98 lives were lost by the wreck of the U. S. steamer *Huron*, no assistance being at hand. A similar misfortune occurred on the 1st of January follow-

ing, on the same coast, by the wreck of the steamer *Metropolis*, whereby 85 lives were lost, the fatality being due to the remoteness of life-saving relief from the point of disaster, the stations in that locality being at that time from 10 to 16 miles apart, and recommendations for their increase, so as to bring them within the ordinary contiguity, made by the General Superintendent for two years previously, having been disregarded. In addition to these, ten lives were lost on other coasts at times when the neighboring stations were closed, and four at points too remote for prompt life-saving aid. The number of lives fairly lost this year within the scope of life-saving activity was 29. The number of lives saved was 1,331.

The season's disasters, no less than its successes, stimulated Congress to action, and the year ended like a peroration with the passage of the act of June 18, 1878, formally organizing the service. The bill was originally introduced by the Hon. S. S. Cox, who for many years had been an ardent friend and promoter of the service. It was opposed by a bill to transfer the service to the Navy, which was introduced in both Houses. Both the House bills were referred to the Committee on Commerce, from which the Hon. Charles B. Roberts reported a substitute, incorporating with Mr. Cox's some features of the other bill. The measure gave rise to a spirited discussion, marked by an able argument in behalf of the existing service from Mr. Roberts, a speech of great brilliancy on the same side from Mr. Cox, and eloquent and cogent speeches from Messrs. James W. Covert, J. J. Yeates, John H. Pugh, W. W. Crapo, M. H. Dunnell, O. D. Conger, and C. H. Brogden. The result was that the bill passed the House without a dissenting voice, and upon reaching the Senate also there passed unanimously. It should be remarked that, so long as its fate was in suspense, the Boards of Trade and Chambers of Commerce in the various maritime cities, the mercantile and marine classes, and the seaboard population incessantly poured memorials and petitions for its passage upon Congress, and protests against the proposed transfer to the Navy. A clever woodcut in one of the leading journals, drawn by our most popular caricaturist, representing Uncle Sam in a boat, fishing up the life-saving bill amid a general shipwreck of sinking bills, with the legend underneath, "The only thing worth saving," was an expressive token of the general warmth of public interest in the establishment. Mr. Kimball was immediately nominated to the Senate, by the President, as the General Superintendent of the newly organized service, and promptly and unanimously confirmed. The provisions of the new act made it of great importance. A leading feature was the organization of the service into a separate and definite establishment, detached from the Revenue Marine, in conjunction with which it had hitherto existed, and placed under the charge of a General Superintendent, whose

and 15 upon the coasts of Virginia and North Carolina; ten of these last taking intermediate places between the existing stations, and abridging the weary distances which had hitherto aggravated the labors and hardships of patrol upon those beaches, and made speedy arrival abreast of a wreck so often impossible, as in the case of the Metropolis. The act will doubtless be supplemented by much legislation, dictated by the requirements of a service constantly growing in utility; but, as it stands, it has set the establishment upon its first really fair footing, enlarged its horizon, and started it upon a fresh career.

The number of stations embraced by the establishment is 196. Twenty-three of these are not yet completed. The stations consist, as before stated, of three classes, severally denominated complete life-saving stations, life-boat stations, and houses of refuge. The act which inaugurated the extension of the service to the coasts of the entire country, which are over 10,000 miles in extent, made their configuration and distinctive vicissitudes of surf and storm the subject of anxious and exhaustive consideration on the part of the Commission of 1873, with the view of determining the most effective species of life-saving aid which could be extended in the several localities to shipwrecked seafarers, under the always narrow appropriations. Beginning with Maine, they had before them a region which from north to south, and in transverse directions, the mighty plow of the glacier had furrowed in immemorial ages with deep valleys, which slope down into the sea; their intervening ridges, broken and irregular, forming submarine rocks and ledges, or appearing as narrow capes, monoliths, reefs, and islands above the surface, causing capricious currents and abrupt variations in soundings, which, with the numerous sunken rocks and peaks and half-submerged islets densely paving the coast, like the teeth in a shark's jaw, make navigation in this locality singularly perilous, while at the same time the lees of the innumerable capes, headlands, and islands afford frequent harbors of refuge or sheltered moorings for vessels which can run their concomitant gauntlet of dangers. These dangers are fearfully augmented by the tremendous severity of winter storms in that latitude, with their accompaniments of impenetrable fog and blinding snow. The numerous lights, buoys, and sound-signals of the Lighthouse Board, and the charts of the Coast Survey, have combined to guard the mariner on this coast, and his hazard is further countervailed by the judicious distribution at certain points, mainly upon outlying islands, commanding wide outlooks upon the ocean, of seven life-saving stations: six of them upon the Maine coast, and the seventh at Rye Beach, where New Hampshire projects a narrow coast upon the sea. These seven stations are comprised by the First Life-saving District. They belong to the class designated as complete life-

saving stations—a class judged proper for all lonely coast localities, where population is either sparse or absent, and aid upon occasions of shipwreck can not be improvised, and where also the means of shelter and subsistence for the rescued are otherwise wanting. Such stations are distinguished from those of other classes by the presence of regularly employed crews of surfmen, and by being built and furnished as their domiciles, and for the temporary accommodation of shipwrecked persons. They are also fully equipped with all the means and appliances for life-saving operations from the shore. The same class of stations was deemed necessary for the coast of Massachusetts, which is contained in the Second Life-saving District. This coast slopes seaward from New Hampshire out to Cape Ann, thence scoops inward for seventy miles, forming Massachusetts Bay, which contains the thick-masted port of Boston, and, trending boldly toward the ocean, makes the great, crooked peninsula of Cape Cod, stretching forty miles outward, then curving abruptly upward for about the same distance, and rudely resembling in conformation an arm raised in challenge to the sea. This cape is dreadful to mariners. Its outer shore is a barren bank of storm-blown sand, for ever shifting under elemental action, beaten by the full force of the Atlantic surf, and skirted off shore by echelons of sunken sand-bars, always advancing or receding, and the frequent occasion of shipwreck along the entire peninsula. Below it are the large islands of Nantucket and Martha's Vineyard, with Buzzard's Bay and Nantucket and Vineyard Sounds around them—waters dangerous with submarine shoals and ledges, while the islands they lave are exposed on their seaward sides to the ocean fury. The whole coast of this district is rough to the mariner. Dangerous islands, rocks, and ledges stud its extent to the northward, along the rugged projection of Cape Ann, and are dense in the inner part of Massachusetts Bay, the entire extent of which lies bare to the scourging easterly and northeasterly gales, and has been the scene of shipwreck for many inward-bound vessels. Complete life-saving stations were nowhere more needed than on the coast of this State, which has fifteen, located at points most liable to cause shipwreck. The same class of stations were found necessary for the coasts of Rhode Island, Block Island, and Long Island, which constitute the Third Life-saving District, and face the sailing tracks of a multitude of vessels bound to or from the great port of New York. From its eastern to its western boundary, the mainland of the entire Rhode Island coast, about forty miles in breadth, fronts the Atlantic, and has stations at three projecting points especially dangerous to shipping. Block Island, lying midway between this coast and the eastern extremity of Long Island, directly in the path of vessels, has two, and Long Island has thirty-three. This stretch of land, measuring from Montauk

to Gravesend about one hundred and twenty miles, and varying from two to twenty-five miles in width, has a beach which is the commencement of an extraordinary formation. This formation is a strip of barren sand, from a quarter of a mile to five miles wide, almost entirely unpeopled, separated by a file of bays from the mainland, which, commencing with Long Island, extends along the Atlantic coast to Cape Fear, North Carolina, a distance of six hundred miles. It is broadly cleft three times in its course southward, by the waters of New York, Delaware, and Chesapeake Bays. The bays which divide it longitudinally from the mainland are narrow till they reach North Carolina, where they spread out into Albemarle and Pamlico Sounds, sinking thence to Cape Fear into swamps and lagoons. A slow and perpetual mutation, varied at times by convulsive alterations, is the law of this long chain of beach. At varying distances it is traversed by narrow inlets, pierced by the ocean, which march steadily downward, year after year, under the action of the north and east winds, the sand closing up behind them, or are arrested or closed by the operation of some violent storm, which may at the same time cleave the beach across with a new inlet. This march of inlets threatens the safety of the stations, and frequently compels their removal. They are menaced also by the ocean, between which and the beach there is unceasing war. At times the beach makes a steady annual advance upon the sea, and then for years is driven back by the onset of the waters. Off shore, along its whole extent, lurk perilous shoals and platoons of submarine bars, for ever changing position, over which in tempests the squadrons of breakers mount and tumble with tremendous upsurge. Gradually curving in from Montauk, this stretch of unstable beaches bends out again four hundred miles below to form the dreaded cape of Hatteras, from which point the coast trends inward to the boundary of Florida. Four great ports—New York, Philadelphia, Baltimore, and Norfolk—bring the ocean paths of commerce close upon this line of beach, and here tempest hunts the ships. The record of the Long Island and New Jersey beaches is terrible. The traveler upon them sees everywhere, protruding from the sands, the skeletons of wrecks, and their old-time story is only of innumerable drowned crews. Here were the earliest and the greatest successes of the Life-saving Service, whose programme devoted this entire line of beach to complete life-saving stations. There are 41 of these in the Fourth Life-saving District, embracing the New Jersey coast; 11 in the Fifth Life-saving District, embracing the coast of Delaware, Maryland, and Virginia as far as Cape Charles; and 25 in the Sixth Life-saving District, embracing the coast of Virginia from Cape Henry, and of North Carolina to Cape Fear. Below Cape Fear, fewer ports, a blander latitude, and the absence of most other vessels than coasters, have thus far made life-saving stations unnecessary for about three hundred miles, when the coast, receding for this distance, again swells out seaward at Florida. The programme of the service was here shaped to new conditions. This coast, closely approached by vessels plying between the Atlantic and the Gulf of Mexico, is a coral formation, five hundred miles in extent, arid and desolate to the last degree, with steep shores and a depth of water which enables vessels, when driven in by the gales and tornadoes of the stormy season, to come up almost high and dry, rendering comparatively easy the escape of their crews, whose chief liability, under these circumstances, is to perish from hunger and thirst. The stations adopted for this coast, therefore, were of the class called houses of refuge, severally inhabited by a keeper and his family, and stocked with provisions for the sustenance of persons cast ashore. There are five of these stations, located on the brink of the coast where vessels are liable to be driven ashore, and comprised within the Seventh Life-saving District. Originally no stations were proposed for the Gulf coast, which is generally a low waste of sand or morass, with shoaling waters and regular soundings, more fatal to marine property than to life when visited by the southern hurricanes; but the recent increase of commerce at Galveston, and the damage wrought to shipping by the prevailing northerns on the coast of Texas, have led to the projection of six life-saving stations for that locality at points marked by recurrent disaster, and embraced by the Eighth Life-saving District. Five of these are complete life-saving stations, and one belongs to the class designated as life-boat stations—a class reserved for populous localities where volunteer crews can be readily collected, and the depth of water enables the English life-boat to be used. The class of life-boat stations (established, it may be said, somewhat experimentally, and with the view of substituting for them complete life-saving stations if, after trial, their protection to life should be found inadequate) belongs particularly to the Lakes and the Pacific coast. The Lakes present marked characteristics. They are a group of enormous inland seas, with 2,500 miles of American coast line, generally regular shores, without many islands, and closed by ice to navigation for nearly six months in the year. They have few natural harbors, and the entrances to most of these are narrow, and increased by the contrivance of double piers jutting out considerable distances. Their principal danger to navigation is involved in their lack of sea-room, which leads vessels to endeavor in storms to run for shelter into the harbors; and the entrances to these being narrow, vessels are apt to miss them, and be swept upon the beach. They are also subject to sudden and violent gales, which pile up seas so tremendous as to sweep anchored vessels fore and aft, often forcing their crews into the rigging,

or causing the craft to founder. At such times, in the case of vessels beached, the life-boat, capable of being at once let down into the water between the piers, at the inner edge of one of which the station is located, can readily slip out to the relief of their crews, and, being very powerful and able to sustain the shock of the rudest seas, can also in the other instance be taken out to vessels laboring in distress at long distances from shore. The Ninth Life-saving District, embracing Lakes Erie and Ontario, has six life-boat stations, the remaining three being complete life-saving stations. Of the thirteen stations of the Tenth Life-saving District, embracing Lakes Huron and Superior, three are life-boat stations; and the Eleventh Life-saving District, embracing Lake Michigan, has thirteen, with five complete life-saving stations. At several of the complete stations on the Lakes, however, there are life-boats as well as surf-boats. The eight stations at different points of the Pacific coast, from Washington Territory to California, comprising the Twelfth Life-saving District, are life-boat stations, this class having been dictated by the nature of the coast, which is very regular, has few harbors, shores remarkably bold, a mild and uniform climate, and only at times, and rarely unexpected, violent storms. At these times, a few prominent headlands or river entrances may occasion disaster to vessels, whose crews can be saved by the life-boat.

The service, thus organized into twelve districts, belongs by its relation to commerce to the Treasury Department. It is under the immediate charge of a General Superintendent (Mr. S. I. Kimball), aided by an Assistant General Superintendent (Mr. W. D. O'Connor), their headquarters being in the Treasury at Washington. An officer of the Revenue Marine (Captain J. H. Merryman) occupies the position of Inspector of Life-saving Stations. Two officers of the Revenue Marine (Captain John McGowan and Captain J. H. Merryman) serve as Superintendents of Construction of Life-saving Stations, supervising all building and repairs, and the purchase of equipments for new stations. Their office is in New York. In each district an officer of the Revenue Marine is stationed as Assistant Inspector, his function being to see that the stations and their equipments are in proper condition, and the crews proficient in the use of the life-saving apparatus. The districts are severally in the charge of a Superintendent. For the Rhode Island portion of the Third District there is an Assistant Superintendent who resides at Block Island. Each Superintendent is appointed after examination, and is required to be a inhabitant of the region, familiar with the coast, and with the action of surf and the use of surf-boats and other life-saving apparatus. He is responsible for the condition and conduct of his district, makes requisition upon the management for all repairs, outfits, and sup-

plies therein necessary, pays the crews, keeps the accounts, and conducts the correspondence. He nominates the Keepers of his district, who are subject to an examination by a Board composed of the local inspector, a surgeon of the Marine Hospital Service, and an accomplished surfman, and thrown out if not able-bodied experts. The Superintendents receive \$1,000 per annum, excepting those of the Third and Fourth Districts, who each receive \$1,500, their respective coasts being more extensive than the others. The Assistant Superintendent of the Third District has \$500 per annum. Each station has a Keeper, the best that can be obtained from the athletic race of beachmen, a master of boat-craft and the art of surfing, and skilled in wreck operations. The profession of a surfman is entirely distinct from that of a sailor, being only acquired by coast fishermen and wreckers after years of experience in passing out and in through the surf, the knowledge of seamen being usually confined to the action of deep water. The Keeper selects his own crew, who are, however, subject to the decision of the Examining Board. He is by law an inspector of customs, having authority for the care of all stranded property, and against smuggling. He preserves inventories of all station property, and journalizes daily the life at the station, sending weekly transcripts of his journal to the General Superintendent for his information. He keeps the station and equipments in order, commands the crew, steers the boat to wrecks, conducts all the operations, and governs his station precincts. At complete life-saving stations they are required to reside constantly with their crews during the active season. At life-boat stations, where there are only volunteer crews, the Keepers must live in the neighborhood, keep sharp lookout for distressed vessels during thick weather, and summon their men upon occasions of need. At houses of refuge, the Keepers live with their families the year round, who after storms travel in both directions from the stations as far as possible, searching for persons possibly cast ashore. The compensation of Keepers is fixed at \$400 per annum, severally. The crews of life-saving stations are six in number, and receive \$40 per month during the active season. They are required to be hardy and skilled surfmen. They constantly patrol the beaches at night, with lanterns and night-signals, on the watch for endangered vessels, and also watch the beach by day, especially in thick weather. This patrol is vigilantly maintained, as befits its importance; and the manner of its observance, including the names of the men, and their mutual meetings, is minutely recorded by the respective Keepers, and the records forwarded to the office of the General Superintendent, where they receive an examination which detects through discrepancy any evasion of the duty. The volunteer crews at the life-boat stations are groups of eight persons, besides the Keeper. They are regularly

enrolled, and are required to be on the watch for the signal for their assembly in thick or stormy weather. They receive \$8 per man for each day devoted to drill and exercise, and \$10 per man for each occasion of service at wrecks.

The scheme of the service places the long chain of complete life-saving stations on the Atlantic beaches within an average distance of five miles of each other, the object being to maintain the intercommunication of patrol, and effect the speedy assembling of several crews in case of the occurrence of a wreck requiring multiplied effort. The complete life-saving stations are generally situated just behind the beach, among the low sand-hills common to such localities. They are typically two-story houses, mainly built of tongued and grooved pine, with gable roofs, covered with cypress or cedar shingles, and strong shutters to the windows, and are securely bolted to a foundation of cedar or locust posts, sunk in trenches four feet deep. Their architecture is of the pointed order, somewhat in the chalet style, with heavy projecting eaves and a small open observatory or lookout deck, on the peak of the roof, from which spires a flag-staff. The walls of the houses are painted drab, with darker color for the door and window trimmings, and the roofs dark red. Over the door is a tablet with the inscription "U. S. LIFE-SAVING STATION." The appearance of the houses is tasteful and picturesque. Their dimensions are from 18 to 20 feet wide by 40 feet long; the later houses are 20 by 45. Below they contain two rooms. One of these is the boat-room, about 10 feet high, occupying over two thirds of the ground-floor space, or measuring about 16 by 30 feet, and opening by a broad double-leaf door into the weather. In this are stored the boats, life-ear, wreck-gun, and most of the apparatus. The other room, about 8 feet high, and measuring about 12 by 16 feet, is the general living-room of the crew. The second story contains three rooms, one for the storage of the lighter apparatus, one for the sleeping-room of the keeper, and one for that of the men; both of these furnished with cot-beds in sufficient number for the accommodation also of the occasional guests sent to the stations by shipwreck. At stations where there is communication with the Signal Service, there is an additional room in the upper story for the accommodation of the signal officer. The later and better built stations have interior walls of lath and plaster, and are furnished outside with cisterns for the collection of rain-water. The lack of fresh water on the beaches is one of the hardships of station-life.

The life-boat stations are usually 24 feet high from base to peak, 42 feet long by 22 feet wide, exterior measurements, and contain a loft above, and a room below 12 feet high, 20 feet wide, and 40 feet long, for the accommodation of the life-boat and its gear. They are built of matched and grooved pine, with gable roofs

shingled with cedar, and are painted like the other stations. They are placed on piles at the water's edge, or set on the inner side of the piers, and are furnished with an inclined platform, or trap in the floor, along which the life-boat is let down and launched into the water by a windlass. Over the door of each is a tablet inscribed "U. S. LIFE-BOAT STATION."



LIFE-SAVING STATION.

The houses of refuge are two-story structures, of a style common at the South, with broad gabled roofs, an ample veranda 8 feet wide on three sides of the structure, and large chimneys in the rear, built outside of the wall. The houses are of pine, raised about six feet from the ground on light wood posts, and the roofs shingled with cypress. Instead of glass, the windows are fitted with wire-gauze mosquito netting. The houses are about 37 feet long by 15 feet wide, not including the veranda space. The upper story is a loft, the lower has three apartments. Each house has capacity for succoring twenty-five persons, with provisions to feed that number for ten days. A boat-house is provided for each station, furnished with a galvanized iron boat with sculls.

A complete life-saving station, fully equipped, costs about \$5,000; a life-boat station about \$4,500; and a house of refuge about \$3,000.

The stations are fully equipped with all minor appurtenances apposite to their purpose, such as anchors, grapnels, axes, shovels, boat-hooks, and wreckers' materials and implements generally; and those which are inhabited are also furnished with stoves, cot-beds, mattresses, blankets, and the utensils requisite for rude housekeeping. The crews find their own provisions. The stations are also provided with all the most approved appliances for saving life from wrecks. First among these is the six-oared surf-boat, the light weight and draught of which make it the only boat yet found suitable for service for the flat beaches and shoaling water of the Atlantic and Gulf coast. Though not invariably of the same model, it is usually of cedar, with white-oak frames, without keel, varying in dimensions, but gen-

erally from 25 to 27 feet long, from 5½ to 6 feet wide, and from 2 feet 3 inches to 2 feet 6 inches in least depth. It has commonly air-cases at the ends and along the interior sides under the thwarts, which make it insubmersible, and is fitted with cork fenders running along the outer sides to protect it against collision with hulls or wreckage. Its weight is from 700 to 1,000 pounds. It is guided by a long steering oar, the steersman standing in the stern. In the hands of the skilled surfmen of our coasts, it

is capable of marvelous action, and few sights are more impressive than the passage out through the flashing breakers of the frail red boat, lightly swimming on the vast intumescence of the surge, held in suspension before the roaring and tumultuous comber, or darting forward as the wall of water breaks and crumbles, obedient to the oars of the impulsive crew. Though sometimes thrown back and broken in desperate and unavailing efforts at a launch against a resistless sea, this

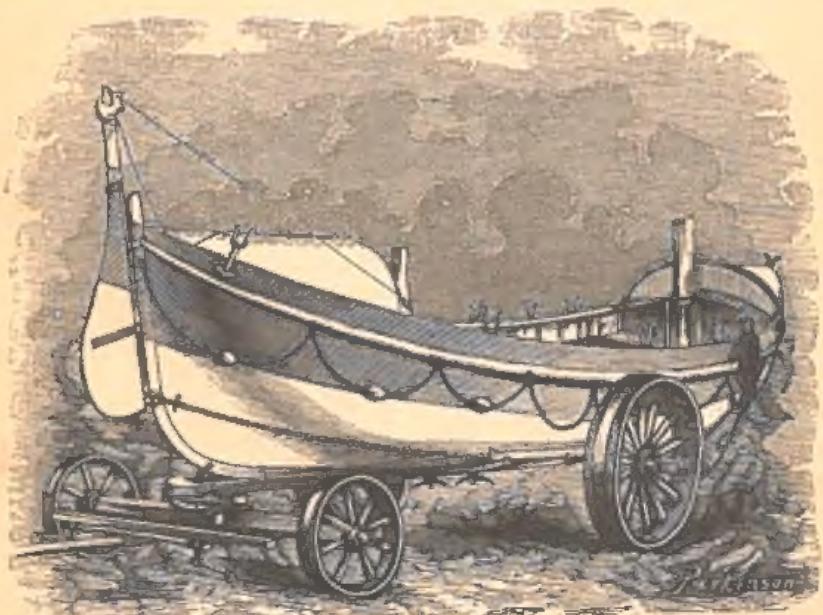


SURF-BOAT UPON ITS CARRIAGE.

boat, which might be upset easily, has rarely in the history of the service been capsized in passing through the surf, so great is the skill of her gallant oarsmen; and certain great surfmen, like Captain Hildreth, of Station 39, New

Jersey, say that in it they will face any sea in which a life-boat can live.

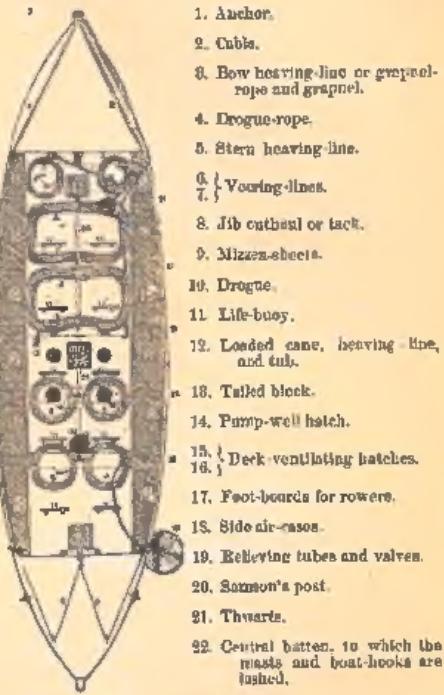
On the Lakes and the Pacific coast, where steep shores or piers command deep water, and by mechanical contrivances heavy boats can



SELF-RIGHTING LIFE-BOAT UPON ITS CARRIAGE.

be launched directly into it, the English life-boat is in general use. This wonderful contrivance, the result of a century of repeated effort, is of massive strength and stability. It is built of double diagonals of mahogany. The size generally in use in this country is about 27 feet in length, a little over 7 feet broad, 3 feet 8 inches deep, carrying eight oars, double-banked, and weighing when empty 4,000 pounds. It is self-righting and self-bailing. In other words, when thrown over, which is difficult to be done, by a heavy sea, it instantly rights and empties. The first of these two extraordinary characteristics, to which a great number of advantages are sacrificed, is effected by a ponderous false keel of iron, which gives the lower part of the boat a constant determination toward the water, while an equal determination from the water is maintained for the upper portion of the boat by a distribution of air-cases at the sides and ends, scientifically proportioned. The self-bailing characteristic is effected by a deck adjusted with reference to the draught of the boat, so that, whatever be the load of the latter, the deck is above the load-line; and being fitted with tubes extending vertically down through the bottom of the boat, it follows that whatever water the boat takes on board falls through the tubes, in obedience to the law which compels fluids to seek their level, and leaves the deck free. The delivery tubes are furnished with self-acting valves, opening to the downward pressure of the water shipped by the boat, and shutting to the pressure of the jets from below. Cork ballast adds by its weight to the stability of the boat, and augments its buoyancy in case the boat be stove. Two masts, made detachable, are provided, fitted with two low lug-sails and a jib. The boat is wellnigh invulnerable, but its great weight and draught, and the resistance its high bows offer to the wind, often make its towage by steam-tug necessary to enable it to reach a wreck at a distance. Particular attention is given to the stowage of its ropes, lines, anchors, and other articles carried in life-boats, these being arranged by a strict method with reference to economy of space and facility of use, and always kept on board, ready for service, lest any of them should be forgotten in the excitement of a sudden summons for wreck duty. Carriages of a peculiar construction are provided in England for the transportation and launching of these boats, together with skids and rollers for returning them to their carriages; but at present in this country they are let down by the trap or inclined platform directly into the water, the station being always at the water's edge. The surf-boats are provided with carriages, by which they are hauled from the stations abreast of wrecks. They are four-wheeled, with bed pieces between each pair of wheels, on which the boat rests, and a long bar or reach connecting the front and back wheels, made separable half-way to enable the boat to be lowered to the ground by withdraw-

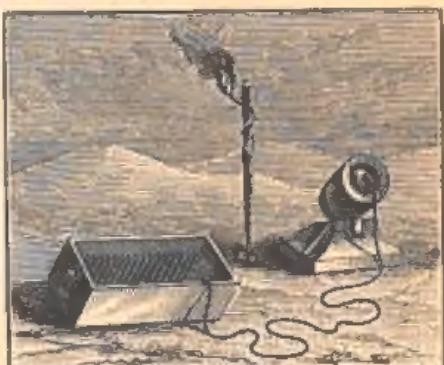
ing a portion of the carriage. The American life-boat, invented by Captain J. M. Richardson, Superintendent of the First Life-saving District, five specimens of which are now in use,



DECK-PLAN OF SELF-RIGHTING LIFE-BOAT, SHOWING MANNER OF STOWING GEAR.

would seem to be better adapted for the service on our coast than the English, being considerably lighter and of less draught, and equally self-righting and self-bailing.

When boat service at a wreck is impracticable, resort is had to life-saving ordnance. The



ÉPROUVEUSE MORTAR, FAIRING-BOX, AND MATCH-STAVE.

gun first in use was an *éprouvette* mortar, of cast iron, weighing 288 pounds, throwing a 24-pound spherical ball with a line attached there-

to, its extreme range being 421 yards. This gave place to the Parrott gun, of cast iron, with a steel tube or lining, weighing, with its ash-wood carriage, 266 pounds, carrying a 24-pound elongated projectile, with a maximum range of 478 yards. The Lyle gun, which has superseded these, is of bronze, smooth bore, weighing 185 pounds, with a cylindrical line-carrying shot weighing 17 pounds, and a range of 695 yards. The reduction in weight over the lightest previous ordnance is 110 pounds, and the increase in range over the old *éprouvette* is 274 yards. Other advantages of the Lyle gun are its strength, owing to the tenacity and ductility of its material, its freedom from corrosion, and its exemption from the erosive action of gases, there being little windage, and from wear by the projectile, this being nearly the length of the bore. The projectile has a shank protruding four inches from the muzzle of the gun, to an eye in which the line is tied—a device which



LYLE GUN.

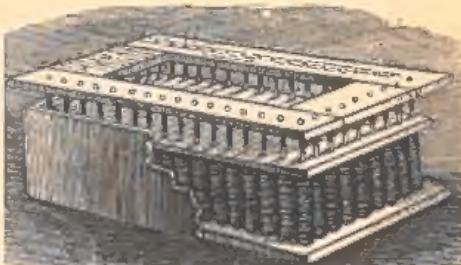
prevents the line from being burned off by the ignited gases in firing. The shot-line is made of unbleached linen thread, very closely and smoothly braided, is waterproofed, and has great elasticity, which tends to insure it against breaking. The lines in use are of varying thicknesses, according to circumstances, ranging from one eighth to three eighths of an inch, and their length varies from 500 to 700 yards. The shot-line is carried in a faking-box—a wooden chest with handles for convenience in carrying. There are two or three sizes in use, the dimensions of the largest being about three feet long by one and a half wide, and a foot deep. Connected with it is a frame, a little larger than the box, with a row of wooden pins set vertically into its four sides. A false bottom, which is a tablet of wood pierced with holes corresponding to the pins, is let down over them until it reaches their bases, and rests upon the frame. In disposing the shot-line, the faker begins at the corner, and coils it in successive diagonal loops or fakes over the pins, layer above layer, until the line is completely rove. The box is then let down over the pins, and fastened at each end to the frame. It is



FIRING SHOT-LINE TO WRECK.

or thirty minutes being requisite to fake a line properly in the box; but it is less desirable, as exposure to the firing sand or the rain or spray lessens the range by impeding the flight of the line. When the shot-line reaches the wreck, the shore end is connected with the whip or

now ready for transportation to the scene of a wreck. When brought there, it is turned upside down, disclosing the false bottom, with the frame superimposed upon it. Two men, one at each end of the box, release the fastenings, and, each pressing his foot upon the false bottom to keep it down, the two lift off the frame, bringing away the pins with it. The false bottom is then lifted off the line, which remains in the box, disposed in the layers of diagonal loops or fakes made by the pins. The line is thus arranged to pay out freely, and fly to a wreck without entanglement or friction.



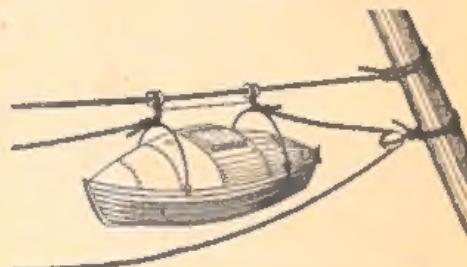
METHOD OF WITHDRAWING FRAME AND PINS FROM SHOT-LINE IN FAKING-BOX.

The end is now tied into the eye of the shank of the shot in the gun; the box, which is always placed a few feet to the windward of the gun, is canted up on one side at an angle of about 45 degrees; and the line is ready for firing. The line is always brought ready faked to the scene of action and fired from the box. In case a second shot is necessary the line is laid out in large loops upon a tarpaulin spread out upon the beach, which is called French faking. This is done to save time, twenty-five

hauling line. This is an endless rope or ellipse, an inch and a half in circumference, and long enough to reach from the shore to the vessel. It is reeved through a pulley-block, having attached to it several feet of rope called a tail. The shot-line is tied around both parts of the whip, a few feet above the pulley-block, and the crew of the vessel at a signal haul the whip on board by means of the shot-line. With it goes a tablet called a tally-board, on which are printed, in French upon one side and in English upon the other, directions for properly setting up the whip-line on the vessel. When this is done, a signal is made to the shore, and a hawser of sufficient length and four inches in circumference, to which is attached another tally-board, bearing printed directions in English and French for its disposition, is tied to one part of the whip or hauling line, and is sent out to the vessel by the life-saving crew pulling upon the other part. Obeying the directions of this tally-board, the men on the ship fasten the hawser to the mast about eighteen inches above the hauling-line. A crotch, made of two pieces of wood, three by two inches thick and ten feet long, crossed near the top, so as to form a sort of X, and bolted together, is erected, and the shore end of the hawser is drawn over the intersection. A sand-anchor, composed of two pieces of hard wood, six feet long, eight inches wide, and two inches thick, crossed at their centers, bolted together, and

sand-anchor, held by the lateral strain against the side of the trench, sustains the slender bridge of rope constituted by the hawser.

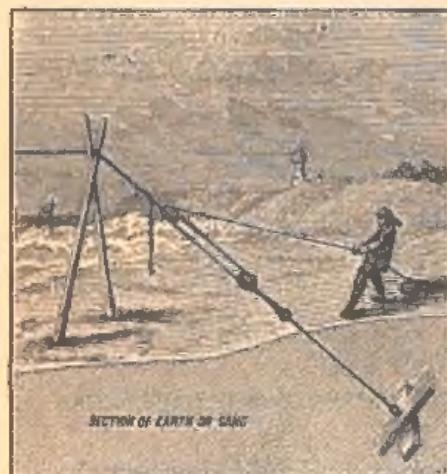
If there are a large number of persons to be saved, the life-car is used. This is a covered boat of galvanized sheet iron, 11 feet 4 inches long, 4 feet 8 inches wide, and 8 feet deep, weighing 225 pounds, which will hold six or seven persons. It is covered with a hatch, and has a few perforations made in the top from the inside, which admit air, while their raised edges exclude water. It is suspended on the hawser by bails and rings, to which are also attached the hauling-lines, all these ropes being arranged to it before the hawser is fastened behind the crotch. It is evident that,



LIFE-CAR, WITH HAWSER AND HAULING-LINES.

by pulling on one part of the hauling-line, the life-saving crew can send out the suspended life-car to the vessel above the surface of the sea, and, when it has received its load, draw it back to the shore by pulling on the other part. Its use has been uniformly successful, 201 persons having been saved by it from the immigrant ship *Ayrshire* at its first trial, in a sea which made boat service impossible and which utterly destroyed the vessel. Another mode of using the life-car is the following: By means of the shot-line, a single hauling-line, something more than the length of the distance of the wreck from the shore, is drawn on board, the end of it being made fast to a ring at one extremity of the life-car. To a ring at the other extremity a similar hauling-line is attached, the end of which remains on shore. By the first hauling-line the car is dragged out through the water, as a boat, by those on board, and, having received its load, is dragged back again through the water by the line handled by the men on land. This method of working the life-car is resorted to under certain exigencies, but is less desirable than the other, because, although the people it contains are safe, the car is liable to be turned over and over in its passage through the breakers, much to their discomfort.

The large majority of the vessels now stranded upon our coasts being coasters (schooners and barks), with crews of from six to ten men, the breeches-buoy is more commonly used. This is a much lighter contrivance, and therefore easier to transport and handle, weighing



CROTCH, HAWSER, AND SAND-ANCHOR.

furnished at the center with a stout iron ring, is laid obliquely in a trench dug behind the crotch. An iron hook, from which runs a strap of rope, having at its other end an iron ring called a bull's-eye, is now fastened into the ring of the sand-anchor. This strap connects by the bull's-eye with a double pulley-block at the end of the hawser behind the crotch, by which the hawser is drawn and kept taut. The trench is solidly filled in, and the imbedded

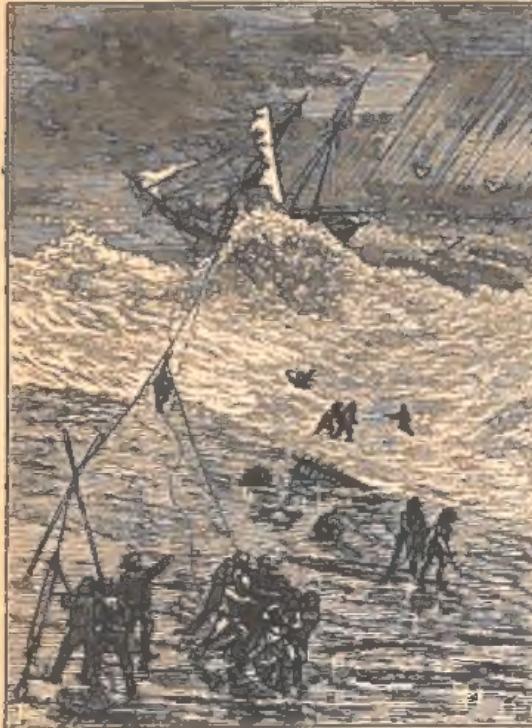
only 21 pounds, and requiring for its use less heavy cordage, the difference in weight between the two with their appendages amounting to over 500 pounds. It consists of a common circular life-preserved of cork, $7\frac{1}{2}$ feet in

a traveler. The hawser passes through this block, and the suspended breeches-buoy is drawn between ship and shore by hauling-lines, like the life-ear. At each trip it receives but one person, who gets into it, sitting, holding to the lanyards, sustained by the canvas saddle, with his legs dangling below, and is pulled swiftly ashore. When there is imminent danger of the breaking up of the vessel, and great haste is required for the rescue, the hawser is sometimes dispensed with, one part of the hauling-line being used for the buoy to travel upon.

The apparatus having to be drawn by the men where horses are not accessible, a hand-cart is provided for this purpose, strongly built, with large wheels having five-inch tires to keep them as much as possible from sinking into the sand. The surf-boat is dragged in the same way on its carriage.

A medicine-chest is furnished for each station. It contains wine and brandy, mustard plasters, volatile salts, probangs, and a few other simple remedies and appliances for reviving exhausted persons or aiding to restore those apparently drowned, printed directions for the use of which are pasted within the lid of each chest. A method of resuscitation is published in the regulations of the service, which is also practically taught to every member of the crews by the visiting surgeon. The method is that of Dr. Benjamin Howard, of New York, with certain modifications by Dr. John M. Woodworth, late Supervising Surgeon-General of the U. S. Marine Hospital Service.

Service. Its extreme simplicity of application and great general utility merit for it a particular description. It begins with the attempt to arouse the patient, who must not be removed, unless there is danger of his freezing, but his



RESCUE BY BREECHES-BUOY.

circumference, to which short canvas breeches are attached. Four rope lanyards fastened to this circle of cork meet above in an iron ring, which is attached by a strap around a block, with composition sheaves, and is called



USING THE BREECHES-BUOY WITH HAULING-LINE WITHOUT HAWSER AND TRAVELING BLOCK.

face exposed to the fresh air, the mouth and nostrils wiped dry, the clothing quickly ripped open so as to expose the chest and waist, and two or three quick, smarting slaps given upon the stomach and chest with the open hand. If the

patient does not at once revive, a bit of wood or a cork is placed between his teeth to keep the mouth open, he is turned upon his face, a large bundle of tightly rolled clothing is placed beneath the stomach, and the operator

preases heavily upon his back over the bundle for half a minute, or as long as fluid flows freely from his mouth. (See cut below.) The mouth and throat are then cleared of mucus by introducing into the throat the end of a

handkerchief wrapped closely around the forefinger; the patient is turned upon his back, under which the roll of clothing is placed so as to raise the pit of the stomach above the level of any other part of the body. If an assistant



THE FIRST STEP TAKEN, BY WHICH THE CHEST IS EMPTIED OF AIR, AND THE EJECTION OF FLUIDS IS ASSISTED.

is present, he holds the tip of the patient's tongue with a piece of dry cloth, out of one corner of the mouth, which prevents the tongue from falling back and choking the entrance to the windpipe, and with his other hand grasps the patient's wrists and keeps the arms stretched

back over the head, which increases the prominence of the ribs and tends to enlarge the chest. The operator then kneels astride the patient's hips and presses both hands below the pit of the stomach, with the balls of the thumbs resting on each side of it and the fingers



THE POSITION AND ACTION OF THE OPERATOR IN PRODUCING ARTIFICIAL RESPIRATION.

between the short ribs, so as to get a good grasp of the waist. (See cut above.) He then throws his weight forward on his hands, squeezing the waist between them with a strong pressure, counts slowly one, two, three, and, with a final push, lets go, which springs him

back to his first kneeling position. This operation, which converts the chest of the patient into a bellows, is continued at a rate gradually increased from four to fifteen times in a minute, and with the regularity observable in the natural motions of breathing which are thus imi-

tated. If natural breathing is not restored in three or four minutes, the patient is turned a second time upon the stomach in an opposite direction from that in which he was first turned, the object being to free the air-passages from any remaining water. The artificial respiration is then resumed and continued if necessary from one to four hours, or until the patient breathes, and when life appears the first short gasps are carefully aided by the same method. From the first, if assistants are present, the limbs of the patient are rubbed, always in an upward direction toward the body and with firmness and energy, the bare hands being used, or dry flannels or handkerchiefs, and the friction kept up under blankets, or over dry clothing. The warmth of the body is also promoted whenever possible by the application of hot flannels to the stomach and armpits, and bottles or bladders of hot water, or heated bricks, to the limbs and the soles of the feet. As soon as breathing is established, the patient is stripped of all wet clothing, wrapped in blankets only, put to bed comfortably warm, but with a free circulation of fresh air, and left to perfect rest. For the first hour a little hot brandy-and-water, or other stimulant, is given every ten or fifteen minutes, and as often afterward as may be expedient. After reaction is established the patient is in great danger of congestion of the lungs, and unless perfect rest is maintained for at least forty-eight hours he may be seized with difficulty of breathing, and death ensues if immediate relief is not afforded. In such cases a large mustard plaster is placed upon his chest, and if he gasps for breath before the mustard takes effect his breathing is assisted by the careful repetition of the artificial respiration. In connection with this process the surfmen are instructed to consider the clinching of the jaws and semi-contraction of the fingers, which have been considered signs of death, to be on the contrary evidences of vitality, and to borrow from them hope and confidence for redoubled effort in the work of resuscitation. This is a discovery of Dr. Laborde, of the Hospital of Lisieux, in France. He found by numerous experiments that the jaws and hands relax when death ensues, *rigor mortis* supervening later.

The Merriman life-saving suit is supplied to the stations, and often proves useful by enabling surfmen to effect rescues of individuals struggling in the breakers, and even to reach wrecks and assist benumbed crews to set up the life-lines. It consists of footed pantaloons of India-rubber, and above the waist of a double ply of the same material covering all but the face, and inflated severally in breast, back, and head, between the plies, by three rubber tubes. Being thus buoyant, and also impervious to air, its wearer can neither drown nor freeze. Since its original introduction at the stations, the exploits of Paul Boyton have given it celebrity.

Upon occasions of boat-service, the life-sav-

ing crews are required by regulation to wear the cork life-belts devised by Captain Ward, the Inspector of the Royal National Life-Boat Institution of Great Britain. These life-belts



LIFE-SAVING DRESS.

weigh severally only $4\frac{1}{2}$ pounds; are flexible, being composed of a series of small blocks of cork strung together; have crenelations under the arms, leaving those members unimpeded in action; and by rendering the surfmen secure from drowning, double their efficiency to assist others in case of exigency.



CORK LIFE-BELT.

The stations are opened for service on the seaboard from September 1st to May 1st, or for a shorter period wherever deemed prudent, and on the Lakes from the opening to the close of navigation. Strict watch and ward is maintained during this period—at the life-boat stations by lookout, and at the complete life-saving stations by patrol. The period between sunset

and dawn is divided into watches, each kept by two men of the crew of six at the several stations. In conformity with this routine, two men issue at sunset from each coast station. They carry beach lanterns and are provided with Coston signals, which are cylindrical cases of combustible materials, fitted into percussion holders. One man goes to the right, the other to the left, each continuing along the beach, keeping watch to seaward, until he meets a similar patrolman from the next station, when he returns to the starting-point, where he sets out again, keeping up his march until the term of his watch expires and that of the next patrol begins. Thus, every night, along the ocean beaches, in moonlight, starlight, thick darkness, driving tempest, wind, rain, snow, or hail, a file of sentinels is strung out, steadily marching, on the lookout for endangered vessels. The duty is arduous, often terrible. Storm tides flooding the beach, quicksands, the bewildering snowfall, overwhelming blasts, bitter cold, are often conditions to the journey. The result is that, should a vessel strand, which usually takes place on some shoal or bar at from one to four hundred yards' distance from the beach, instead of being left unnoticed for many hours, to be torn to pieces by the furious surf, she is sure to be soon discovered by the patrolmen. Seeing her, he at once strikes the bottom of his percussion holder, driving its spike into the Coston cartridge, which ignites with a fierce deflagration, reddening the darkness, and notifying those on board the wreck that they are seen. The patrolman then races to his station and brings the crew. The keeper knows by the state of the surf whether the boat can be used, or whether to resort to the life-car, or breeches-buoy. The boat always puts out if possible, this being the speediest mode of succor. If the surf be impasseable, the wreck-gun casts its lariat over the wreck, the hawser and hauling-lines are set up, and the imperiled seafarers are drawn ashore. By whatever mode the rescue is effected, it involves hours of racking labor, protracted exposure to the roughest weather, and a mental and bodily strain under the spur of exigency and the curb of discipline which greatly exhausts the life-saving crews. In the case of the boat-service, whether by surf-boat or life-boat, tremendous perils are added to new hardships. The result of these gallant toils in the rigors of the winter beach and the drench of the surf, since the date of original organization in 1871, has been extraordinary. During this period of eight years, statistics show that there have been, within the scope of life-saving operations, 6,287 persons imperiled on stranded vessels. Of these, 5,981 were saved, and only 306 lost—197 of these at wrecks remote from stations, or at times when they were closed, and the others, in nearly every instance, under circumstances which rendered human aid impossible. During this period the stations have also given succor to 1,382 persons. Their crews have, more-

over, notably performed wreckers' duty, and saved large amounts of marine property. The virtue of organization is attested by these results, but large credit must always be given to the noble fidelity, capability, and dauntless courage of the stout groups of seven who man the lonely stations. Wherever native manliness is held in honor, these heroic pleiads of the seaboard beaches, and the gangs of nine who drive the life-boats through overwhelming seas upon the Lakes and the Pacific, with hearts greater than danger, can never fail of their need.

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